



# 2020 Winter Readiness Workshop

November 18<sup>th</sup> , 2020



## MISO Winter Readiness and Projections:

There are adequate resources to meet peak forecasted demand of 104 GW and required Operating Reserves of 2.4 GW

Transmission limitations on the system are within the expected norms

We continue to review performance for lessons learned and feed them back into the process for improved operations

# KEY FACTS ABOUT MISO

42 million end-use customers

400+ market participants

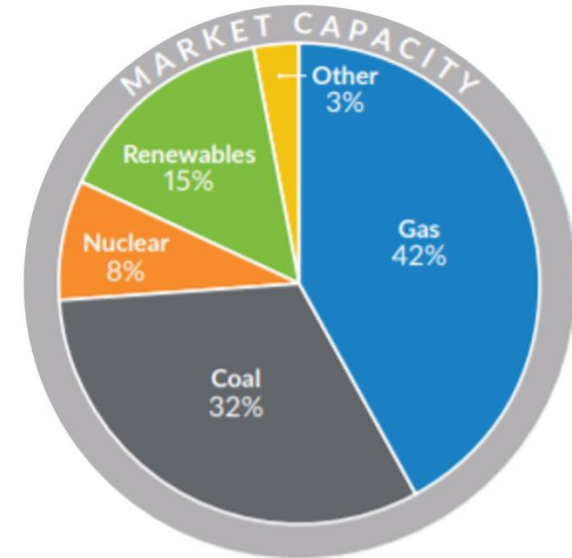
\$30 billion energy market

5-minute dispatch to over 6,000 electric generating units

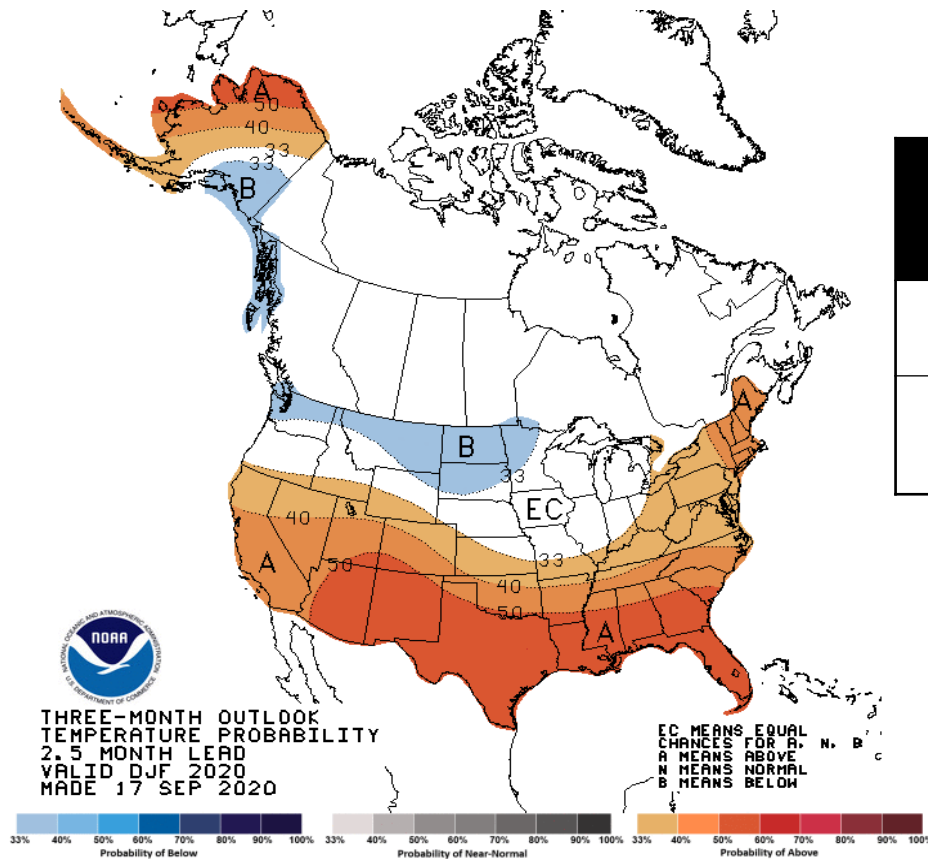
MISO's reliability footprint and locations of regional control centers



- 68,000 miles Transmission miles >69 kV
- 127,000 MW Peak Load (Market)
- 174,000 MW Generation capacity
- 290,000 SCADA data points
- 15 states
- One Canadian province
- Historic Wind Peak (November 1<sup>st</sup>, 2020) 18,475 MW



# Adequate resources are projected to be available to cover demand and outages for the winter 2020-2021 season



## MISO Preliminary Winter 2020-2021 Forecast

Winter Peak Forecast

104 GW

Total Projected Available Capacity\*

146 GW

All-time Winter Peak:

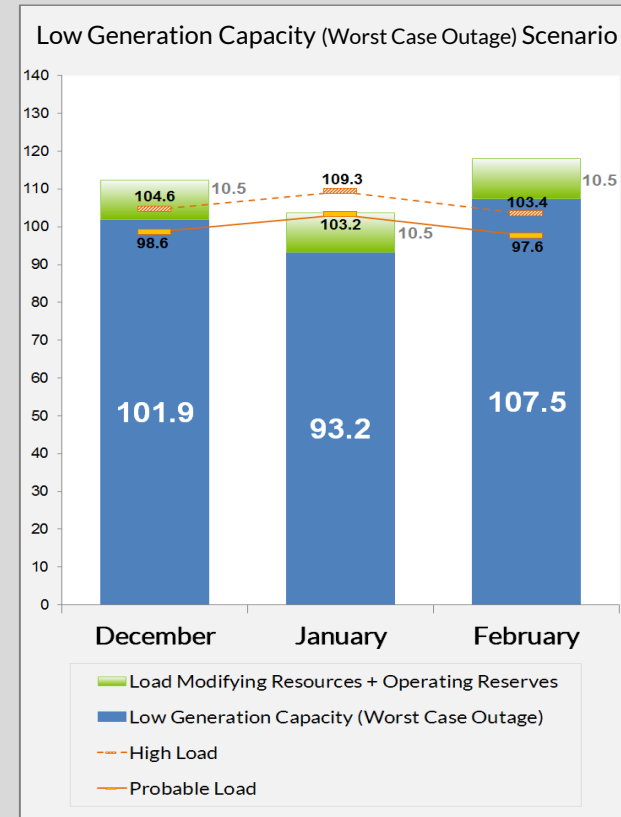
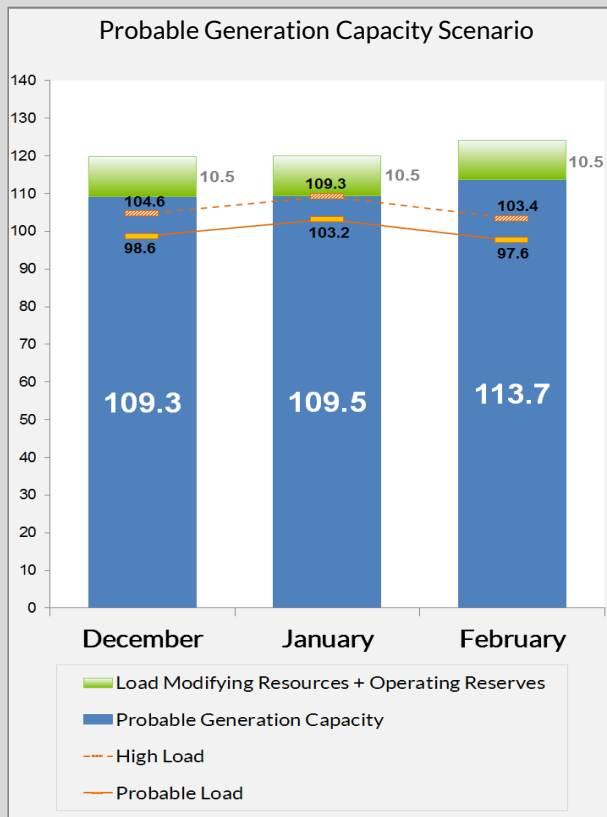
109 GW on January 6<sup>th</sup>, 2017

NOAA forecasts warmer than normal temperatures for the MISO South region and colder than normal temperatures for the majority of Zone 1

# Adequate resources are projected to be available to meet the expected winter demand forecast

Winter scenarios with high generation outages and high demand could drive operational challenges

## Winter 2020-2021 Resource Adequacy Projections (GW)



# The transmission limitations in the system are within the expected norms for the upcoming Winter

## Steady-State AC Contingency Analysis

- Evaluate the effects of simple and complex contingencies on the MISO footprint and Tier-1 areas
- IROL review
- **No major constraints that do not have mitigations for this Winter**

## Thermal Analysis during Energy Transfer Simulations

- First Contingent Incremental Transfer Capability (FCITC)
- Evaluate the impact of high MW transfers & identify key flowgates and lines that may limit transfers
- 6 transfer analyses studied

## Voltage Stability Analysis during Energy Transfer Simulations

- Power-Voltage Analysis (PV)
- Analyze high transfers in combination with transmission & generator outages which can cause stability issues across the footprint
- 1 High Voltage interfaces studied

## Phase Angle Analysis during Energy Transfer Simulations

- Identifies large phase angle differences associated with reclosing a transmission line
- Identify angle differences before and after an energy transfer

# Previous winter weather challenges provide lessons learned and opportunities for improvement

## Southwest Cold Weather Event

February 2011

Extended cold weather overwhelmed many of the weatherization steps taken by both generating and natural gas production facilities



## Polar Vortex

January 2014

Challenging operating conditions highlighted the need for better electric-gas coordination, outage reporting, and winter readiness preparations



## Extreme Cold Weather

January 2018

Regional operators called for voluntary reductions in electricity use due to abnormally cold temperatures and higher than forecast demand



## Polar Vortex

January 2019

Arctic air plummeted temperatures to record lows while wind chills dipped to the -40 to -65-degree range. Wind generation was impacted due to cold weather cut outs





## Contact Info

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